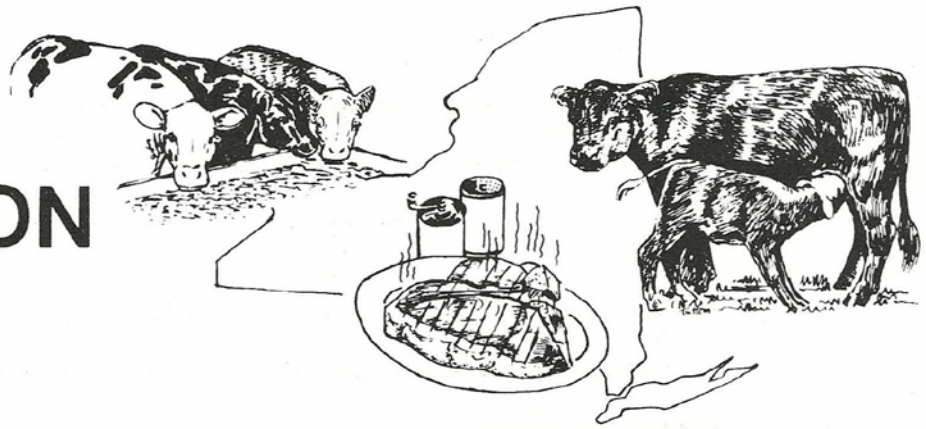
CORNELL BEEF PRODUCTION REFERENCE MANUAL



Feeding Beef Cows and Their Nursing Calves

Fact Sheet 1300b

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The goal of a cow/calf operation should be to wean a calf at a given weight every 12 months. To maximize profit this production must be optimized to minimize costs per unit of weight sold. Developing an economical feeding system during the winter is the main driver to profitability as winter feed represents more than half the annual cost of beef production. The good beef producer knows the nutrient value of the feeds available and knows how to use these to meet the requirements of the cow at various stages of her reproductive cycle.

The nutrients of greatest practical concern to beef producers are energy (TDN or total digestible nutrients), crude protein (CP), calcium (Ca), phosphorous (P) and Vitamin A. Other nutrients such as salt and various trace minerals are certainly important, but their requirements are normally met by feeding trace mineralized salt. The major exception is the requirement for selenium, which can be met by injection or feeding.

The National Research Council is responsible for reporting the nutritional requirements of most animal species. These requirements are affected by stage of production, cow weight, milk production and environmental conditions.

Common sense dictates that higher production increases nutrient requirements, i.e. lactating cows have higher requirements than dry cows. Table 1 lists the effect of frame size and milk production on the weight of the calf. Use this table to determine the milk production of your cows.

Table 1. Weight of male calves expected at different milk production levels

	Month since birth		
	5	6	7
Peak Milk, lb	Frame size 4 (1100 lb)		
12	374	431	492
18	404	464	527
24	433	495	562
	Frame size 6 (1250 lb cow)		
12	396	457	523
18	429	493	558
24	457	523	592
	Frame size 7 (1320 lb cow)		
12	407	469	537
18	442	508	573
24	469	537	607
	Frame size 8 (1400 lb cow)		
12	418	482	552
18	454	522	588
24	480	550	621

Once you know the milk production of your cow herd you can determine the energy and protein requirements (Table 2). From this table we can determine that a 1100 lb dry cow with a potential peak milk yield of 12 lb requires 11.2 lb of TDN and 1.6 lb of protein per day, or 53% TDN and 8% protein in the diet.

Table 2. Daily TDN and crude protein (CP) requirements of beef cows

	Stage of production			
	Dry		Early lactation	
	TDN	CP	TDN	CP
	----------lb. (%)----------			
Peak Milk, lb	Frame size 4 (1100 lb cow)			
12	11.2 (53)	1.6 (8)	12.1 (56)	2.0 (9.4)
18	11.2 (53)	1.6 (8)	13.3 (60)	2.2 (10.9)
24	11.2 (53)	1.6 (8)	14.5 (65)	2.5 (12.3)
	Frame size 6 (1250 lb cow)			
12	12.4 (53)	1.8 (8)	13.7 (55)	2.2 (9.2)
18	12.4 (53)	1.8 (8)	14.6 (59)	2.5 (10.2)
24	12.4 (53)	1.8 (8)	15.5 (63)	2.8 (11.3)
	Frame size 7 (1320 lb cow)			
12	12.5 (53)	1.9 (8)	13.4 (55)	2.2 (9.1)
18	12.5 (53)	1.9 (8)	14.6 (59)	2.5 (10.1)
24	12.5(53)	1.9 (8)	15.9 (63)	2.8 (11.2)
	Frame size 8 (1400 lb cow)			
12	13.1 (53)	1.9 (8)	14.0 (55)	2.3 (9.0)
18	13.1 (53)	1.9 (8)	15.2 (58)	2.6 (10.0)
24	13.1 (53)	1.9 (8)	16.5 (62)	2.9 (11.0)

These guidelines hold true with the assumption that the cow is eating at least 2.2% of her bodyweight. Therefore the 1100 lb. cow should be consuming 22 lbs. of dry matter (DM). For dry hay, which is usually 90% DM this equals approximately 24 lbs. per day (22 lb. ÷ 0.90). When feeding a wet feed such as baleage, the value would be greater. For example if the percent DM of the baleage was 60, the 1100 lb. cow would need to consume 37 lb. per day (22 lb. ÷ 0.60).

Finally, poor environmental conditions increase requirements due to extra energy expended to keep warm (Table 3). Using the previous example of a 1100 lb dry cow with a potential peak milk yield of 18 lb, here requirement of 11.2 TDN would be increased to 12.6 lb (11.2 lb + 1.4 lb) if housed outside with no wind protection and wet, muddy conditions.

Table 3. Adjustment for environmental conditions

Condition	Added TDN requirements, lb/day
Outside, no wind protection, wet and mud covered	1.4
Outside, no wind protection, dry	0.9
Outside, wind protection, wet and mud covered	1.0
Inside, wind protection, dry	0.8